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| EXAMINER | |
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| SERRAO, RANODHI N | |

| ART UNIT | PAPER NUMBER |
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| 2141 | |

DATE MAILED: 08/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/056,238 | EDSALL ET AL. | |
| | Examiner | Art Unit | |
| | Ranodhi Serrao | 2141 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *03 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3 and 5-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 5-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments, see remarks, filed 03 July 2006, with respect to the rejection(s) of claim(s) 1, 3, 5-61 under 35 U.S.C. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art reference(s). See rejections below.

2. The applicant furthermore argued that Brewer et al. in combination with Blumenau fail to teach the limitation of claim 21. However, this is incorrect since Blumenau teaches a lock manager handling lock requests in col. 15, lines 11-15, and Brewer teaches sending commands to a master port in col. 8, lines 20-60. Therefore it would be obvious to one of ordinary skill in the art to combine the cited references to teach the claimed invention.

### *Claim Rejections - 35 USC § 103*

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 12, 14, 15, and 18-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al. (6,260,120) and Oberman et al. (2003/0026267).

5. As per claim 1, Blumenau et al. teaches a method of implementing storage virtualization on a network device of a storage area network (see Blumenau et al., column 8, lines 5-7), the method comprising: (a) receiving a frame or packet at a port of

the network device (see Blumenau et al., column 12, lines 9-17), wherein the network device is a switch, router, iSCSI gateway, or other network node configured to perform a switching function (see Blumenau et al., col. 18, lines 35-51 and col. 40, lines 44-53); (b) determining that the frame or packet pertains to access of a virtual storage location of a virtual storage unit representing one or more physical storage locations on one or more physical storage units of the storage area network (see Blumenau et al., column 25, lines 29-49); (c) obtaining a virtual-physical mapping between the one or more physical storage locations and the virtual storage location (see Blumenau et al., column 24, lines 34-55); and (d) sending a new or modified frame or packet to an initiator or a target specified by the virtual-physical mapping (see Blumenau et al., column 30, lines 24-45). But fails to teach wherein (b), (c), and (d) are performed by logic dedicated to and implemented by said port of the network device. However, Oberman et al. teaches wherein (b), (c), and (d) are performed by logic dedicated to and implemented by said port of the network device (see Oberman et al., ¶ 148). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Blumenau et al. to wherein (b), (c), and (d) are performed by logic dedicated to and implemented by said port of the network device in order to reduce the processing required at egress and output the packet without undue processing in the output block (see Oberman et al., ¶ 80).

6. As per claim 12, Blumenau et al. and Oberman et al. teach a network device, wherein the virtual storage unit is a virtual logical unit and the one or more physical storage units are physical logical units (see Blumenau et al., column 30, lines 24-45).

7. As per claim 14, Blumenau et al. and Oberman et al. teach a method, the method further comprising: generating one or more new packets or frames or modifying the received packet or frame in a manner that replaces a destination address of the virtual storage unit with one or more destination addresses of the one or more physical storage units (see Blumenau et al., column 12, lines 9-17).

8. As per claim 15, Blumenau et al. and Oberman et al. teach a method, the method further comprising: generating a new packet or frame or modifying the received packet or frame in a manner that replaces a source address of a physical storage unit with a source address of the virtual storage unit (see Blumenau et al., column 12, lines 18-26).

9. Claims 3, 5-11, 13, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al. and Oberman et al. as applied to claim 1 above, and further in view of Lo et al. (2002/0103943).

10. As per claim 3, Blumenau et al. and Oberman et al. teach the mentioned limitations of claim 56 above, but fail to teach a network device, wherein the virtual storage unit comprises a VLUN or other virtual representation of storage on the storage area network. However, Lo et al. teaches a network device, wherein the virtual storage unit comprises a VLUN or other virtual representation of storage on the storage area network (see Lo et al., paragraphs 0037 and 0422). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the above limitation to a network device, wherein the virtual storage unit comprises a VLUN or other virtual representation of storage on the storage area network in order to reduce the processing

required at egress and output the packet without undue processing in the output block (see Oberman et al., ¶ 80).

11. As per claims 5-11, 13, 16, and 17, the above-mentioned motivation of claim 3 applies fully in order to combine Blumenau et al., Oberman et al., and Lo et al.

12. As per claim 5, Blumenau et al., Oberman et al, and Lo et al. teach a method, wherein the frame or packet received at the port of the network device is a fibre channel frame (see Lo et al., paragraph 0064).

13. As per claim 6, Blumenau et al., Oberman et al, and Lo et al. teach a method, wherein the frame received at the port of the network device is an iSCSI frame (see Lo et al., paragraph 0069).

14. As per claim 7, Blumenau et al., Oberman et al, and Lo et al. teach a network device, wherein the frame or packet received at the port of the network device comprises a read or write command (see Lo et al., paragraph 0334).

15. As per claim 8, Blumenau et al., Oberman et al, and Lo et al. teach a method, wherein the frame or packet received at the port of the network device comprises a SCSI read or write command (see Lo et al., paragraph 0336).

16. As per claim 9, Blumenau et al., Oberman et al, and Lo et al. teach a method, wherein determining that the frame or packet pertains to access of a virtual storage location comprises identifying an address of the virtual storage unit in the frame or packet from the initiator (see Lo et al., paragraph 0404).

17. As per claim 10, Blumenau et al., Oberman et al, and Lo et al. teach a method, wherein the address is a destination address (see Lo et al., paragraph 0405).

18. As per claim 11, Blumenau et al., Oberman et al, and Lo et al. teach a method, wherein determining that the frame or packet pertains to access of a virtual storage location comprises identifying an address of the port in a destination address field of the frame or packet from the target (see Lo et al., paragraph 0415).

19. As per claim 13, Blumenau et al., Oberman et al, and Lo et al. teach a method, wherein the virtual-physical mapping is defined by a virtualization model (see Lo et al., paragraph 0404).

20. As per claim 16, Blumenau et al., Oberman et al, and Lo et al. teach a method, the method further comprising: generating a new packet or frame or modifying the received packet or frame in a manner that replaces a source address of the initiator with an address of the port on the network device (see Lo et al., paragraph 0405).

21. As per claim 17, Blumenau et al., Oberman et al, and Lo et al. teach a network device, at least one of the processor and the memory being further adapted for: generating a new packet or frame or modifying the received packet or frame in a manner that replaces a destination address of the port on the network device with a destination address of the virtual storage unit (see Lo et al., paragraph 0407).

22. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al. and Latif et al. as applied to claims 1, 45, and 47 above, and further in view of Lo et al. Blumenau et al. and Latif et al. teach the mentioned limitations of claims 1, 45, and 47 above but fail to teach a network device, wherein the type of traffic is iSCSI. However, Lo et al. teaches a network device, wherein the type of traffic is iSCSI (see Lo et al. paragraph 0128). It would have been obvious to one having

ordinary skill in the art at the time of the invention to modify the above limitation to add a network device, wherein the type of traffic is iSCSI in order to employ the appropriate transport layer and upper-layer protocol combinations in the backbone. Also allowing over gigabit Ethernet based networks (see Lo et al. paragraph 0121).

23. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al. and Oberman et al. above as applied to claim 56 above, and further in view of Latif et al. (6,400,730).

24. As per claim 18, Blumenau et al. and Oberman et al. teach the mentioned limitations of claim 56 above but fail Blumenau et al. fails to teach a network device, wherein (b), (c), and (d) are performed by a processor dedicated to only said port of the network device. However, Latif et al. teaches a network device, wherein (b), (c), and (d) are performed by a processor dedicated to only said port of the network device (see Latif et al., col. 18, lines 8-42). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Blumenau et al. to a network device, wherein (b), (c), and (d) are performed by a processor dedicated to only said port of the network device in order to allow the port interfaces provide the conversion from the input frame format to an internal frame format, which can be routed within the apparatus (see Latif et al., abstract).

25. As per claim 19, Blumenau et al. teaches a network device, at least one of the processor and the memory being further adapted for requesting a lock of the one or more physical storage locations prior to submitting a read or write command to the one

or more physical storage locations (see Blumenau et al., column 29, lines 6-30). But fails to teach by said port of the network device. However, Latif et al. teaches by said port of the network device (see Latif et al., col. 17, line 34-col. 18, line 7). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Blumenau et al. to by said port of the network device in order to in order to allow the port interfaces provide the conversion from the input frame format to an internal frame format, which can be routed within the apparatus (see Latif et al., abstract).

26. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al., Oberman et al., and Latif et al. Blumenau et al., Oberman et al., and Latif et al. teach a network device, wherein requesting a lock of the one or more physical storage locations comprises requesting a lock of the virtual storage location (see Blumenau et al., column 29, line 57-column 30, line 20).

27. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al., Oberman et al., and Latif et al. as applied to claims 1 and 19 above, and further in view of Brewer et al. (6,876,656).

28. As per claim 21, Blumenau et al., Latif et al., and Oberman et al. teach the mentioned limitations of claims 1 and 19 above and furthermore Blumenau et al. teaches a network device, wherein requesting a lock of the one or more physical storage locations comprises: sending a lock request to a lock manager of a network device within the storage area network, wherein the lock manager is adapted for managing lock requests. But fail to teach sending a lock request to a master port of a

network device within the storage area network, wherein the master port is adapted for managing lock requests. However, Brewer et al. teaches sending commands to a master port (see Brewer et al., col. 8, lines 20-60). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Blumenau et al., Latif et al., and Oberman et al. to sending commands to a master port in order to redirect at least some of the read transaction data frames and the write transaction write data and transfer ready frames in a network so as to bypass a storage manager and pass directly between the client and a storage device via a switch (see Brewer et al., abstract).

29. Claims 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al., Oberman et al., Latif et al., and Brewer et al.

30. As per claim 22, Blumenau et al., Latif et al., Oberman et al., and Brewer et al. teach a network device, at least one of the processor and the memory being further adapted for: receiving a lock grant from the master port of the network device within the storage area network (see Blumenau et al., column 12, lines 27-54 and column 29, line 57-column 30, line 20).

31. As per claim 23, Blumenau et al., Latif et al., Obermen et al., and Brewer et al. teach a network device, wherein the granted lock indicates that at least one of exclusive read and write access to the virtual storage location is granted (see Blumenau et al., column 29, line 57-column 30, line 20).

32. As per claim 24, Blumenau et al., Latif et al., Oberman et al., and Brewer et al. teach a network device, at least one of the processor and the memory being further

adapted for: sending a transfer ready message to the initiator when the lock grant is received (see Blumenau et al., column 8, lines 48-65).

33. As per claim 25, Blumenau et al., Latif et al., Oberman et al., and Brewer et al. teach a network device, at least one of the processor and the memory being further adapted to: requesting a release of the granted lock from the master port of the network device within the storage area network (see Blumenau et al., column 12, lines 27-54 and column 16, lines 50-59).

34. As per claim 26, Blumenau et al., Latif et al., Oberman et al., and Brewer et al. teach a network device, at least one of the processor and the memory being further adapted for: receiving a notification that the granted lock has been released by the master port (see Blumenau et al., column 12, lines 27-54 and column 12, line 66-column 13, line 12).

35. As per claim 27, Blumenau et al., Latif et al., Oberman et al., and Brewer et al. teach a network device, wherein requesting a release of the granted lock is performed when the read or write command has been successfully completed (see Blumenau et al., column 21, lines 6-42).

36. As per claim 28, Blumenau et al., Oberman et al., Latif et al., and Brewer et al. teach a network device, wherein the command has been successfully completed when a status indicating that the command was successful is received from the initiator or the target (see Blumenau et al., column 21, lines 6-42).

37. Claims 29-48, 50-53, and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blumenau et al., Oberman et al.

38. As per claim 29, Blumenau et al. and Oberman et al. teach a method, wherein the frame or packet received at a port of the network device comprises a read or write command indicating an amount of memory to be read or written to, the method further comprising: allocating the amount of memory at the network device (see Blumenau et al., column 16, lines 50-59).

39. As per claim 30, Blumenau et al. and Oberman et al. teach a method, further comprising: receiving a status from the target after the sending of the new or modified frame or packet to the target (see Blumenau et al., column 11, lines 1-14); and when the status indicates that the command was successful, de-allocating the amount of memory at the network device (see Blumenau et al., column 32, lines 19-33).

40. As per claim 31, Blumenau et al. and Oberman et al. teach a method, wherein the frame or packet received at a port of the network device comprises a read or write command, the method further comprising: receiving a transfer ready signal from the target after the sending of the new or modified frame or packet, the transfer ready signal indicating that the target is ready to receive a transfer of data (see Blumenau et al., column 8, lines 48-65).

41. As per claim 32, Blumenau et al. and Oberman et al. teach a method, further comprising: sending a transfer ready signal to the initiator after the sending of the new or modified frame or packet, the transfer ready signal indicating that the network device is ready to receive a transfer of data from the initiator; wherein sending the transfer

ready signal to the initiator is performed prior to receiving a transfer ready signal from the target (see Blumenau et al., column 8, lines 48-65).

42. As per claim 33, Blumenau et al. and Oberman et al. teach a method, wherein the frame or packet received at a port of the network device comprises a read or write command, the method further comprising: receiving a status after the sending of the new or modified frame or packet, the status indicating whether the command was successful (see Blumenau et al., column 21, lines 6-42).

43. As per claim 34, Blumenau et al. and Oberman et al. teach a method, further comprising: sending the status to the initiator (see Blumenau et al., column 21, lines 6-42).

44. As per claim 35, Blumenau et al. and Oberman et al. teach a method, further comprising: sending a second new or modified frame or packet to an initiator or a target specified by the virtual-physical mapping (see Blumenau et al., column 30, lines 24-45); receiving a second status after the sending of the second new or modified frame or packet, the second status indicating whether the command was successful (see Blumenau et al., column 21, lines 6-42); merging the status and the second status (see Blumenau et al., column 21, lines 6-42); and sending the merged status to the initiator (see Blumenau et al., column 21, lines 6-42).

45. As per claim 36, Blumenau et al. and Oberman et al. teach a method, further comprising: determining from the status whether the command was successful (see Blumenau et al., column 21, lines 6-42); and re-sending the new or modified frame or

packet when it is determined that the command was not successful (see Blumenau et al., column 21, lines 43-58).

46. As per claim 37, Blumenau et al. and Oberman et al. teach a method, further comprising: sending the status to the initiator when it is determined that the command was successful (see Blumenau et al., column 21, lines 6-42).

47. As per claim 38, Blumenau et al. and Oberman et al. teach a method, wherein the new or modified frame or packet comprises data (see Blumenau et al., column 12, lines 9-17).

48. As per claim 39, Blumenau et al. and Oberman et al. teach a method, wherein the new or modified frame or packet comprises a read or write command (see Blumenau et al., column 8, line 48-65).

49. As per claim 40, Blumenau et al. and Oberman et al. teach a method, wherein the frame or packet received at a port of the network device comprises data, the method further comprising: storing the data in a memory location; wherein re-sending the new or modified frame or packet comprises: obtaining the data from the memory location; and sending a new or modified frame or packet including the obtained data to the initiator or the target specified by the virtual-physical mapping (see Blumenau et al., column 30, lines 24-45).

50. As per claim 41, Blumenau et al. and Oberman et al. teach a method, further comprising: receiving data from the target specified by the virtual-physical mapping; and storing the data in a memory location (see Blumenau et al., column 30, lines 24-45).

51. As per claim 42, Blumenau et al. and Oberman et al. teach a method, wherein re-sending the new or modified frame or packet comprises: obtaining the data from the memory location; and sending a new or modified frame or packet including the obtained data to the initiator specified by the virtual-physical mapping (see Blumenau et al., column 30, lines 24-45).

52. As per claim 43, Blumenau et al. and Oberman et al. teach a method, wherein re-sending the new or modified frame or packet comprises sending the new or modified frame or packet to an alternate target specified by the virtual-physical mapping, the method further comprising: receiving alternate data from the alternate target specified by the virtual-physical mapping; and comparing the alternate data with the data stored in the memory location (see Blumenau et al., column 8, lines 48-65).

53. As per claim 44, Blumenau et al. and Oberman et al. teach a method, further comprising: employing a mirror algorithm to select the alternate target (see Blumenau et al., column 9, lines 10-24).

54. As per claim 45, Blumenau et al. and Oberman et al. teach a network device as recited in claim 1, wherein the frame or packet received at the port of the network device and the new or modified frame or packet sent by the network device are compatible with a standard protocol (see Blumenau et al., column 9, lines 25-49).

55. As per claim 46, Blumenau et al. and Oberman et al. teach a network device, wherein the standard protocol is SCSI (see Blumenau et al., column 9, lines 25-49).

56. As per claim 47, Blumenau et al. and Oberman et al. teach a network device, wherein the frame or packet received at the port of the network device and the new or

modified frame or packet sent by the network device are compatible with a type of traffic to be carried by the frames or packets (see Blumenau et al., column 9, lines 25-49).

57. As per claim 48, Blumenau et al. and Oberman et al. teach a network device, wherein the type of traffic is fibre channel (see Blumenau et al., column 9, lines 25-49).

58. As per claim 50, Blumenau et al. and Oberman et al. teach a method, wherein the frame or packet received at the port of the network device comprises a SCSI read command and the new or modified frame or packet sent by the network device comprises a SCSI read command (see Blumenau et al., column 34, lines 20-32).

59. As per claim 51, Blumenau et al. and Oberman et al. teach a method, wherein the frame or packet received at the port of the network device comprises a SCSI write command and the new or modified frame or packet sent by the network device comprises a SCSI write command (see Blumenau et al., column 34, lines 33-47).

60. As per claim 52, Blumenau et al. and Oberman et al. teach a network device, wherein the frame or packet received at the port of the network device comprises a read command and the new or modified frame or packet sent by the network device comprises a read command (column 34, lines 20-32).

61. As per claim 53, Blumenau et al. and Oberman et al. teach a network device, wherein the frame or packet received at the port of the network device comprises a write command and the new or modified frame or packet sent by the network device comprises a write command (see Blumenau et al., column 34, lines 33-47).

62. As per claim 59, Blumenau et al. and Oberman et al. teach a method, wherein the new or modified frame or packet includes at least one of a source address and

destination address obtained from the virtual-physical mapping (see Blumenau et al., column 12, lines 9-17 and column 12, lines 18-26).

63. As per claim 60, Blumenau et al. and Oberman et al. teach a method, wherein the received frame or packet includes a source address and destination address, and wherein the obtained information includes at least one of the source address and the destination address (see Blumenau et al., column 12, lines 9-17 and column 12, lines 18-26).

64. As per claim 61, Blumenau et al. and Latif et al. teach a method wherein sending a lock request to another port of a network device within the storage area network comprises: sending a lock request to another port of a switch, router, iSCSI gateway, or other network node configured to perform a switching function (see Blumenau et al., column 19, lines 4-31).

65. Claims 54-58 have similar limitations as to claims 1, 3, and 5-53, therefore, they are being rejected under the same rationale.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ranodhi Serrao whose telephone number is (571)272-7967. The examiner can normally be reached on 8:00-4:30pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on (571)272-3880. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RUPAL DHARIA
SUPERVISORY PATENT EXAMINER